

THE LARVAL DESCRIPTION AND ECOLOGICAL NOTES OF A  
CADDISFLY, *NECTOPSYCHE TAVARA* (ROSS) FROM  
THE CENTRAL FLORIDA REFUGIUM  
(TRICHOPTERA: LEPTOCERIDAE)

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The genus *Nectopsyche* (formerly *Leptocella*) in North America was revised by Haddock (1977) and at that time the larval stage of *N. tavana* was unknown. This paper provides a description of the larvae and notes on their bionomics.

*Nectopsyche tavana* (Ross) appears to be restricted to the lakes of the central Florida highlands region. Adults have been recorded from Lake, Levy and Orange counties (Ross, 1944) and have also been collected from Lake Placid in Highlands County and Prairie Lake in Seminole County. The hypothesis of a Florida refugium has had considerable support by zoogeographers working with a variety of organisms. Clench and Turner (1956) showed that the antiquity and distinctiveness of the freshwater molluscan fauna offer evidence that the central Florida region was an island during the Pliocene and Pleistocene eras. They also found that a considerable number of species of freshwater molluscs did not range east or south of the Suwannee River in northcentral Florida and that the fauna indicated that the headwaters of the Chattahoochee and Flint Rivers have persisted since mid-Tertiary time. They termed the Florida refugium area "Orange Island," a modification of the "island of Florida," coined by Dall (1903). Howden (1969) also cites several additional examples of well-studied groups such as some meloids, scarabs, the genus *Melanoplus* and certain lycosid spiders that show evidence of having survived the Pleistocene in several parts of peninsular Florida.

Recently, a series of adults and the previously unknown larvae of *N. tavana* were collected from Lake Conway and nearby Lake Fredrica. These lakes may be characterized as unpolluted, good-water quality lakes falling in the mesotrophic range of eutrophication. Utilizing the limnological lake

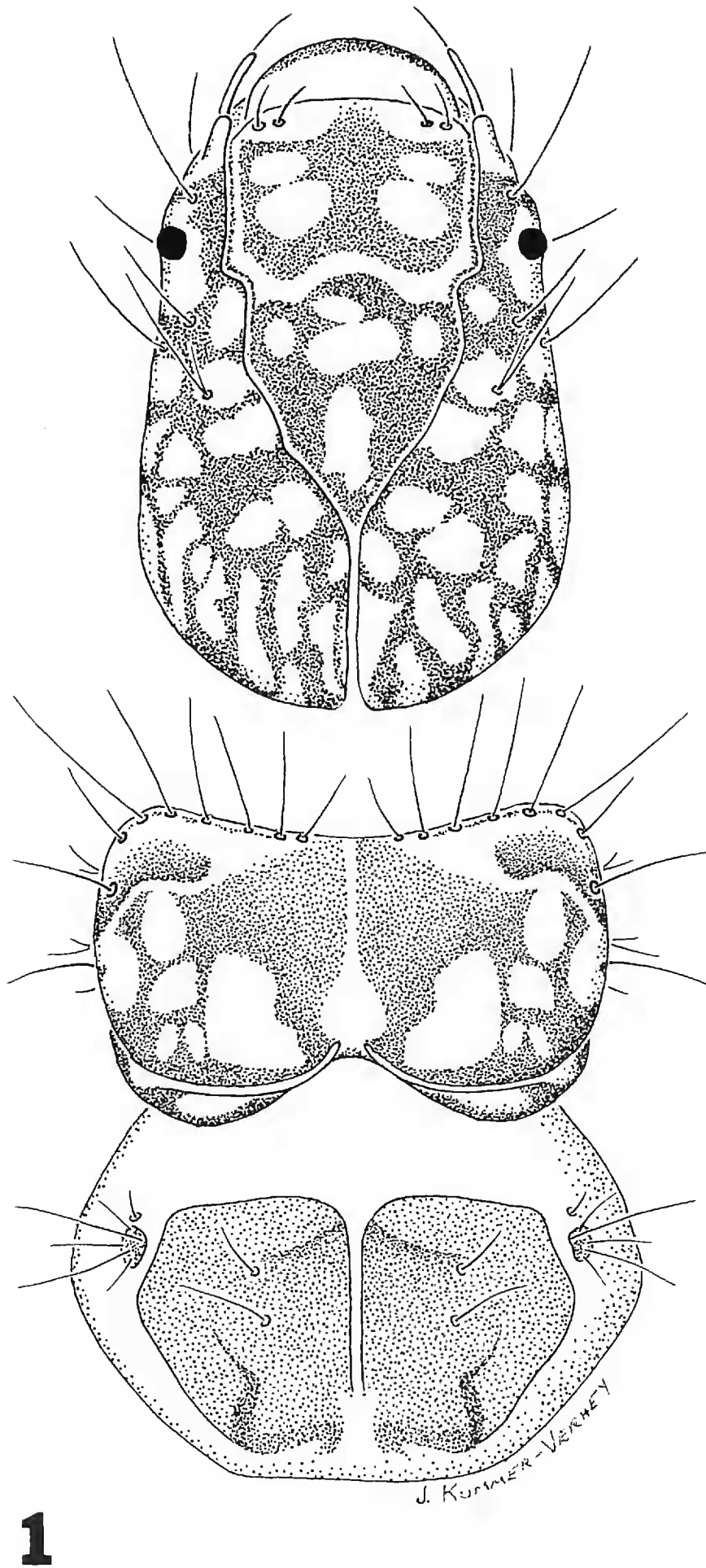


Fig. 1. *Nectopsyche tavana* head capsule, pro and mesothorax, dorsal view,  $\times 80$ .

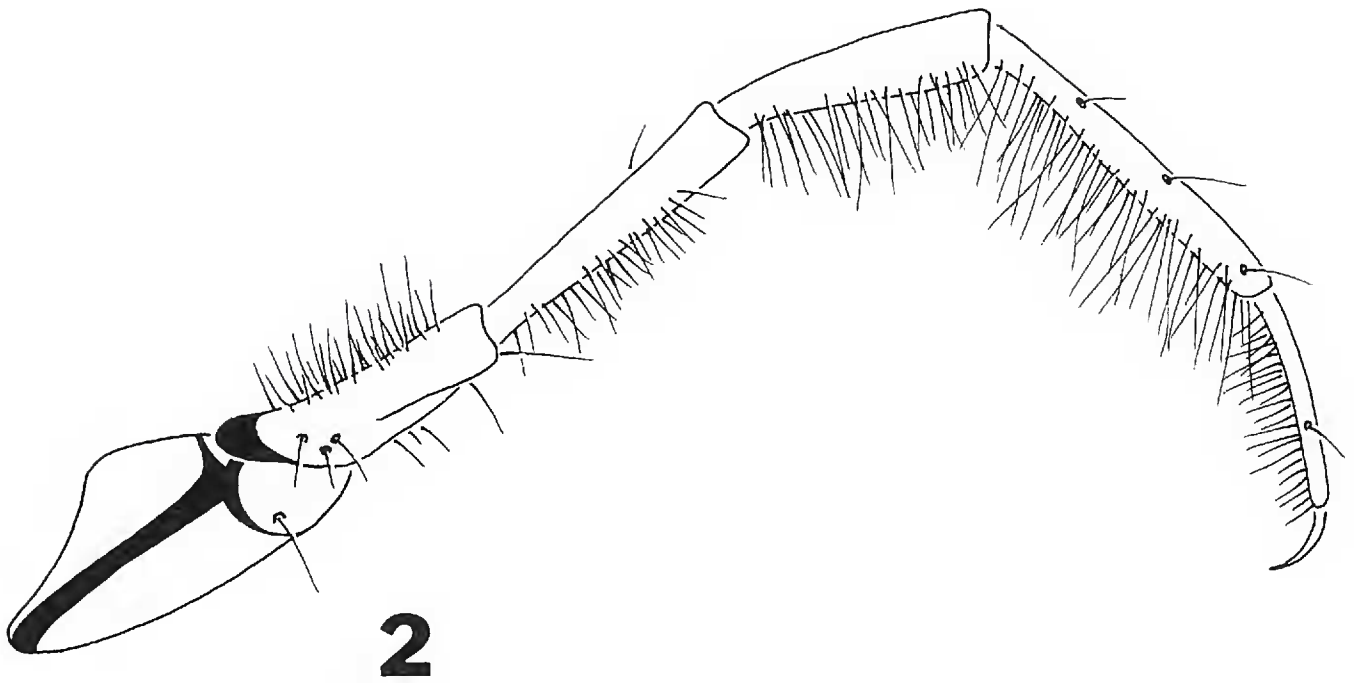


Fig. 2. *Nectopsyche tavana* swimming brush on metathoracic leg, lateral view,  $\times 50$ .

classification scheme of Shannon and Brezonik (1972) the two lakes would be considered mesotrophic in three categories. Water analyses revealed that chlorophyll a readings for Lakes Conway and Fredrica were 6.5 and 5.0 mg/l respectively. Total phosphates were 0.025 and 0.026 mg/l with total organic nitrogen 0.60 and 0.50 mg/l.

The larvae are phytophagous, feeding on submerged aquatic macrophytes such as southern naiad (*Najas guadalupensis* (Spreng.) Magnus), fanwort (*Cabomba caroliniana* Grey), Illinois pondweed (*Potamogeton illinoensis* Morong), stonewort (*Nitella megacarpa* L.), and hydrilla (*Hydrilla verticillata* Royle). Adult associations were made from larvae reared in the laboratory on these plants with various size groups observed in daytime feeding. No attempt was made to establish a chronological life-history with detailed instar classification data. Both early and late instar larvae swim utilizing the swimming brush on the metathoracic leg. The larval case is elongate-linear, composed primarily of sand grains and typically with a plant stem attached to the antero-dorsal side (Fig. 3). The length of the case averages about 18 mm. Prior to pupation the larvae affix themselves to suitable sites on food plant leaves and stems by means of an anterior and a posterior secreted holdfast. The larvae modify their pupal chamber by sectioning off part of the posterior case and any inherent plant matter. Pupal duration averages about 20 days except for the overwintering generation.

Adults can be collected from March to October on vegetation, grasses and trees along the shoreline. They appear to be multivoltine as many size classes of larvae can be collected. An emergence period occurs in late March

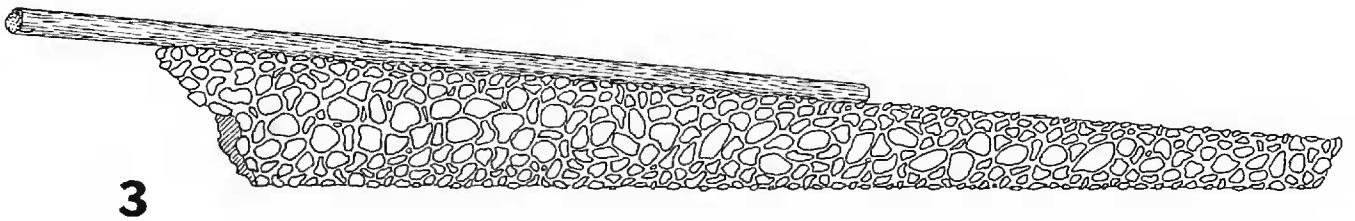


Fig. 3. *Nectopsyche tavana* larval case, lateral view,  $\times 16$ .

followed by the peak summer emergence in early July. A smaller fall emergence follows in late September.

*Description.*—Larval characters for *N. tavana* are consistent with the generic diagnosis of *Nectopsyche* larvae provided by Wiggins (1977). A ventral band of tiny spines lateral to the anal opening, characteristic of some mature *Nectopsyche* larvae, is absent in this species.

*Diagnosis.*—Larvae of *N. tavana* can be distinguished from other Nearctic species of *Nectopsyche* on the basis of the following combination of characters: anterior half of fronto-clypeus with medial, longitudinal, brown stripe dividing four oval, luteous spots that appear as “figures 8’s”; an inconspicuous gill found in the posterolateral region of the metanotum; a well-developed swimming brush on the metathoracic leg and the absence of gills on the first abdominal segment.

Mature larvae are very similar to those of *N. spiloma* but can be distinguished by the presence of numerous luteous spots surrounded by brown pigmentation in the posterior half of the gena in addition to the coloration of the fronto-clypeus as mentioned above. *N. spiloma* is allopatric from *N. tavana* and is common in the large rivers of the Mississippi River drainage, in the Edwards plateau of Texas as well as extending into Central America.

Larvae of *N. tavana* also bear a superficial resemblance to a western species, *N. gracilis* (senior synonym of *N. intervena* Banks in Wiggins, 1977) but shows consistent difference in head and pronotal color patterning. In addition, *N. gracilis* larvae have no metanotal gills.

*Mature larva.*—Maximum body length 13 mm. *Head* (Fig. 1).—Anterior margin of labrum with narrow transverse brown band; mandible with basal two-thirds luteous, distal portion black; anterolateral margins of fronto-clypeus luteous; anterior region of fronto-clypeus with two pairs of luteous spots, in some larvae separation of spots indistinct; posterior half of fronto-clypeus with four luteous markings of unequal size; entire dorsum of head with luteous oval to oblong-shaped spots separated by dark brown irregularly-shaped reticulations; subocular line of weakness present, bisecting gena; posterior portion of gena with many luteous spots similar to those on fronto-clypeus; vertical area of gena luteous with light brown border along medial margin; black spot present anterior to base of antenna; ventral apo-

tome triangular, pale. *Thorax*.—Pronotum with area medial to lines of weakness ranging from light to dark brown posteromedial portion luteous; lateral areas of pronotum with marbled blotching as seen on dorsum of head; sclerotized portion of mesonotum predominantly brown with luteous indistinct stripe in central area; posterolateral corner of metanotum with dark brown sclerotized stripes running posteriorly; inconspicuous gill present in posterolateral area of metonotum. *Legs*.—Legs luteous to light brown in color; tarsus of prothoracic leg with 3 or 4 bristles on ventral margin; prothoracic tibia with two stout spines on ventral margin near apex and two bristles lying slightly mesad; prothoracic femur with many bristles on ventral margin; mesothoracic tibial spines on ventral margin shorter than maximum width of tibia; well-developed swimming brush on metathoracic leg (Fig. 2) consisting of double fringe of setae on femur and tibia and single row of setae on tarsus. *Abdomen*.—Tracheal gill formula on abdominal segments: I-0; II-3; III-1; IV-1; V-1; VI-1; VII-0,1; abdominal segment I with sclerotized bar and circular roughened area on each lateral hump characteristic for genus; ventral band of tiny spines absent from area lateral to anal opening.

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